

Application No. 10/583,390
Amendment Dated November 29, 2010
Reply to Office Action Dated August 31, 2010

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (currently amended) A brake pad for a disc brake that can be associated with a caliper with thrust means for clamping said brake pad with friction against a braking band of a brake disc, wherein the brake pad comprises:

a plate with a central portion provided with a layer of friction material, said central portion having an upper edge and an opposed lower edge and also two lateral edges; two support appendages which extend from said lateral edges of the central portion, each of said support appendages bounding an eye capable of receiving a pin of the caliper, wherein said upper edge and lower edge extend substantially along circumferences of a circle imparting an arcuate shape to the central portion so that said upper edge is substantially convex and said lower edge is substantially concave, and said support appendages are disposed substantially at the height of said lower edge of said brake pad.

2. (original) A brake pad according to claim 1, wherein said central portion forms together with the support appendages an Omega "Ω"-shaped structure.

3. (original) A brake pad according to claim 1, wherein the lateral edges are substantially rectilinear, parallel and perpendicular to a direction tangential to said upper edge at a point halfway between said lateral edges.

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4. (original) A brake pad according to claim 3, wherein the support appendages extend substantially perpendicularly to the lateral edges.

5. (original) A brake pad according to claim 1, wherein each of the support appendages comprises an upper surface facing in the same direction as the upper edge and capable of constituting a bearing surface for a brake pad spring element.

6. (original) A brake pad according to claim 5, wherein said upper surfaces are substantially flat and parallel to the direction tangential to the upper edge at a point halfway between the lateral edges.

7. (original) A brake pad according to claim 1, wherein said eyes have a substantially rectangular shape with the corners rounded or chamfered.

8. (original) A brake pad according to claim 1, wherein the eyes are disposed substantially on a tangent to the lower edge at a point halfway between the lateral edges.

9. (original) A brake pad according to claim 1, wherein from each of the lateral edges there extends near the upper edge protuberance which forms a prolongation of the upper edge outside the central portion, said protuberances comprising a bearing surface which constitutes an opposing surface for a brake pad spring element.

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10. (original) A brake pad according to claim 9, wherein said bearing surfaces are inclined with respect to the tangents and to the upper edge and lower edge of the central portion, so as to allow the brake pad spring elements abutting on them to exert a resilient thrust towards the central portion.

11. (original) A brake pad according to claim 1, having a symmetrical shape.

12. (currently amended) A caliper for a disc brake comprising thrust means for clamping at least two brake pads with friction against a braking band of a brake disc, wherein said caliper comprises at least two seats receiving said brake pads, each of said seats comprising:

a central space bounded by a connecting member which connects the two lateral walls of the caliper and a lower edge of the lateral wall opposed to the aforesaid connecting member, and also, laterally, by two containment walls;

two outer spaces which extend laterally from the central space, there being arranged in each of said outer spaces a pin capable of engaging a respective eye of said brake pad, wherein both the connecting member and the lower edge extend along circumferences of a circle, imparting an arcuate shape to the central space so that an upper edge of said connecting member is substantially convex and said lower edge is substantially concave, and said outer spaces are disposed substantially at the height of said lower edge of the caliper.

13. (currently amended) A caliper according to claim 12, wherein said seat formed by the arcuate central space together with the outer spaces has a substantially Omega "[□] Ω" shape.

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14. (original) A caliper according to claim 12, wherein the seats at the lower edge are open towards the outside of the caliper and devoid of opposing or bearing surfaces which may prevent displacement of the brake pad.

15. (original) A caliper according to claim 12, wherein each of said containment walls constitutes a seat for a brake pad spring element and has an upper surface facing radially outwards with respect to the axis of rotation of the brake disc and inclined towards the inside of the central space.

16. (original) A caliper according to claim 15, wherein the upper surfaces are substantially flat and lie in planes which intersect the lower edge at a point halfway between the two containment walls.

17. (original) A caliper according to claim 15, wherein each of said containment walls has a lower surface disposed on the side of the containment walls opposed to the upper surfaces and facing in the same direction as the lower edge of the lateral wall.

18. (original) A caliper according to claim 17, wherein the lower surfaces are substantially flat and extend in a direction parallel to the directions tangential to the connecting member and to the lower edge at a point halfway between the containment walls.

19. A caliper according to claim 18, wherein said lower surfaces of the containment walls bound at the top said outer spaces containing the pins.

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20. (original) A caliper according to claim 12, wherein said pins are obtained separately from the caliper and then connected thereto.

21. (original) A caliper according to claim 12, wherein the longitudinal axes of the two pins of each seat lie approximately in a plane tangent to the lower edge of the respective lateral wall at a point halfway between the two containment walls.

22. (original) A caliper according to claim 15, wherein from said upper surfaces of the containment walls a stop tooth protrudes which is capable of engaging a suitable recess of the brake pad spring element to secure the latter on the containment wall.

23. (original) A caliper according to claim 22, wherein said stop tooth is spaced from the surface of the seat so as to delimit between the latter and the stop tooth a passage for the brake pad spring element.

24. (original) A caliper according to claim 17, wherein each of the lower surfaces of the containment walls has a recess capable of receiving a protuberance of said brake pad spring element.

25. (original) A caliper according to claim 12, wherein said caliper is a fixed caliper.

26. (currently amended) A disc brake comprising a caliper comprising thrust means for

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clamping at least two brake pads with friction against a braking band of a brake disc, wherein said caliper comprises:

at least two seats for receiving said brake pads, each of said seats comprising:

a central space bounded by a connecting member which connects the two lateral walls of the caliper and a lower edge of the lateral wall opposed to the aforesaid connecting member, and also, laterally, by two containment walls;

two outer spaces which extend laterally from the central space, there being arranged in each of said outer spaces a pin capable of engaging a respective eye of said brake pad, wherein both the connecting member and the lower edge extend along circumferences of a circle, imparting an arcuate shape to the central space so that said connecting member is substantially convex and said lower edge of said lateral wall is substantially concave, and said outer spaces are disposed substantially at the height of said lower edge of the caliper,

and said disk brake further comprising:

a brake pad that can be associated with said caliper, wherein the brake pad comprises:
a plate with a central portion provided with a layer of friction material, said central portion having an upper edge and an opposed lower edge and also two lateral edges;

two support appendages which extend from said lateral edges of the central portion, each of said support appendages bounding an eye capable of receiving a pin of the caliper, wherein said upper edge and lower edge extend substantially along circumferences of a circle imparting an arcuate shape to the central portion so that said upper edge of said plate of said brake pad is substantially convex and said lower edge said plate of said brake pad is substantially concave, and said support appendages are disposed substantially at the height of said lower edge of said brake pad.

27. (original) A disc brake according to claim 26, wherein the chamfering radius of the eyes is less than the radius of the cylindrical pins so that the mutual bearing between the pin and the chamfered corner of the eye occurs at two points of contact.

28. (original) A disc brake according to claim 27, wherein the material of the plate of the brake pad is suitable for undergoing plastic deformation within certain limits, such as to adapt the shape of the eye in the region of contact with the pin of the caliper exactly to the shape of the pin.

29. (original) A disc brake according to claim 27, equipped with one or more brake pad spring elements, wherein each of said spring elements comprises an elongate plate of resilient material, which plate is bent so as to form a "C"-shaped base, preferably rectangular or trapezoidal, or alternatively arcuate, said base being capable of tightening resiliently about said containment wall of the caliper.

30. (original) A disc brake according to claim 29, wherein the base of the brake pad spring element is in the shape of a trapezium open along the major base and shaped so as to be substantially complementary to the shape of the containment wall.

31. (original) A disc brake according to claim 29, wherein an upper section of said base has a recess capable of receiving a tooth formed on the containment wall of the caliper.

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32. (original) A disc brake according to claim 31, wherein said recess is formed by a notch transverse to the length of the plate which involves only a part of the width of the plate so that a bridge remains which ensures the structural continuity of the spring element in the region of the recess.

33. (original) A disc brake according to claim 32, wherein at the two opposed sides of the recess two limbs are formed which are bent back so as to constitute opposing walls capable of bearing from two opposed sides against said tooth of the caliper, while the bridge can be positioned in a space between the tooth and the lateral wall of the caliper.

34. (original) A disc brake according to claim 29, wherein a lower section of said base has a protuberance capable of engaging a recess provided in the containment wall of the caliper.

35. (original) A disc brake according to claim 34, wherein the protuberance of the spring element has been obtained by means of local deformation of the plate, for example by means of punching or shearing and bending.

36. (original) A disc brake according to claim 34, wherein the protuberance is formed by a limb of the spring element bent back towards the inside of the base.

37. (original) A disc brake according to claim 29, wherein from the upper side and lower side of the base of the spring element 3 there extend respective pressure sections, upper and lower, capable of biasing the brake pad resiliently so as to hold it in its position in the seat.

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38. (original) A disc brake according to claim 37, wherein the upper pressure section and lower pressure section are bent back with respect to the adjacent upper side and lower side of the base and extend in a direction substantially opposed to these latter.

39. (original) A disc brake according to claim 38, wherein the upper pressure section and lower pressure section are oriented towards the closed side of the base.

40. (original) A disc brake according to claim 29, wherein each pressure section of the spring element forms together with the adjacent lateral section of the base a resilient arc, the elastic deformation of which is capable of forming, with the spring element mounted, a resilient bias acting on the brake pad.

41. (original) A disc brake according to claim 29, wherein the brake pad spring element has an overall shape similar to the letter "ζ" (lower case Greek letter zeta) or to its mirror image.

42. (original) A disc brake according to claim 29, wherein the brake pad spring element has an overall shape similar to the letter "Σ" (upper case Greek letter Sigma) or to its mirror image.

43. (original) A disc brake according to claim 29, wherein each seat of the caliper has associated with it two brake pad spring elements which have a structure and shape which is chiral, that is to say, mirror-image but not superimposable.